

Brinkman, Alfred Henry (1873-1945)

Herb. received 1922

includes ca 215 bryophytes, some
identified by G.B. Kaiser.

Obit. Bryologist 49: 1-3. 1946

Note - he collected and sold plants,
mostly bryophytes, from British
Columbia. There were printed
lists. Have we any?

Canadian Hepatics by A. Brinkman,
Bowling Lake

Alberta
Canada

- Marchantia polymorpha*, L
Marsipella emarginata, (Schk) Dum
Lophoria badensis, (Gottsche) Schffn
barbata, (Schreb) Dum
travertina, Schffn
heterocolpa, (Thed) M a Howe
Hunseana, (Haben) Evans
lycopodioides, (Wallr)
Gymphyrolenia, (Nees) Schffn
Rutheana, (Limpr) M a Howe
ventricosa, (Richs) Dum
Sphenobolus politus, (Nees) Steph
scitulus, (Engl) Steph
Lophocolea minor, Nees
Chiloscyphus pallescens, (Schk) Dum
fulgens
Gym. nidularis, (Schrad) Nees
Telepharantoma trichophyllum, (L) Dum
Ptilidium cilium, (L) Nees
puberulum, (Web) Himpf
Porella nidularis, (Nees) Trevis

Brinkman A.
Canadian Hepatics

Nov 30 1913

Canadian Hepatites
by Brinkman

(over)

<i>Ablystegium compactum</i>	153	<i>Encalypta rhabdocarpa</i>	362
<i>filicinum</i>	651	<i>Eurhynchium diversifolium</i>	300
<i>Juratzkanum</i>	175	<i>strigosum</i>	52
<i>Kochii</i>	91	<i>Pissidens subbasilaris</i>	405
<i>riparium</i>	394	<i>grandifrons</i>	343
<i>serpens</i>	395	<i>Fontinalis chrysophylla</i>	247
<i>V tenue</i>	268	<i>gigantea</i>	140
<i>Ablystegiella subtilis</i>	17	<i>Kindbergii</i>	444
<i>Andreae petrophila</i>	349	<i>nitida</i>	219
<i>Antitrichia californica</i>	372	<i>neo-mexicana</i>	68
<i>curtipendula</i>		<i>Georgia geniculata</i>	192
<i>V gigantea</i>	373	<i>pellucida</i>	258a
<i>Lulacornium palustre</i>	406	<i>Grimmia apocarpa</i>	222
<i>Amphidium lapponicum</i>	266	<i>V gracilis</i>	220
<i>Barbula vinealis</i>	238	<i>ovata</i>	350
<i>Bartramia oederi</i>	761	<i>pulvinata</i>	74
<i>Brachythecium albicans</i>	311	<i>tenuicaulis</i>	201
<i>Clareosum</i>	284	<i>Gymnostomum curvirostre</i>	281
<i>Bivulare</i>	232	<i>Grimmia torquata</i>	519
<i>rutabulum</i>	7	<i>Hedwigia albicans</i>	123
<i>oxycladon</i>		<i>Hemalia Jamesii</i>	50
<i>salesbrosum</i>	333	<i>Hypoglypnum dilatatum</i>	1001
<i>V turgidum</i>	297	<i>eugyrium</i>	
<i>Bryum affine</i>	264	<i>V mackayi</i>	780
<i>caespiticiun</i>	858	<i>ochraceum</i>	291
<i>capillare</i>	997	<i>palustre</i>	119 & 156
<i>pallens</i>	90	<i>Hypnum reptile</i>	22
<i>pallescens</i>	836	<i>Hylocomium proliferum</i>	55
<i>turbinatum</i>	683	<i>robustum</i>	296
<i>uliginosum</i>	270	<i>triquetrum</i>	335
<i>ventricosum</i>	775	<i>Leskea polycarpa</i>	27
<i>Calligeron giganteum</i>	266	<i>Leptobryum filiforme</i>	286
<i>stramineum</i>	277	<i>Lecesia trichodes</i>	962
<i>Camptothecium nevadense</i>	287	<i>Anium hornum</i>	302
<i>pinnatifidum</i>	167	<i>medium</i>	258
<i>nitens</i>	462	<i>punctatum</i>	1614
<i>Campylium chrysophyllum</i>	347	<i>venustum</i>	552
<i>polygamum</i>	716	<i>Heckera lenziesii</i>	374
<i>Catharina undulata</i>	346	<i>Orthotrichum anomalum</i>	122
<i>Ceratodon purpureus</i>	221	<i>cupulatum</i>	208
<i>Cinclidium stygium</i>	352	<i>obtusifolium</i>	5
<i>Claopodium whippleanum</i>	59	<i>rupestre</i>	269
<i>Climacium dendroides</i>	275	<i>Sturmii</i>	266
<i>Cicranoweisia cirrhata</i>	225	<i>Paludella squarrosa</i>	438
<i>crispula</i>	976	<i>Philnotis fontana</i>	240
<i>Cicranum Bergeri</i>	381	<i>Polytrichum commune</i>	
<i>Bonjeani</i>	168	<i>V uliginosum</i>	427
<i>fuscescens</i>	402	<i>juniperinum</i>	
<i>scoparium</i>	393	<i>V alpinum</i>	285
<i>sparium</i>	448	<i>strictum</i>	256
<i>strictum</i>	160	<i>Pohlia cruda</i>	492
<i>undulatum</i>	522	<i>albicans</i>	772
<i>Histichium capillaceum</i>	57	<i>comutata</i>	772
<i>Hitrichum flexicaule</i>		<i>nutans</i>	603
<i>V brevifolium</i>	527	<i>Pseudoleskea atrovirens</i>	218
<i>Arepanocladus gracilliescens</i>	668	<i>radicosa</i>	512
<i>capillifolius</i>	103	<i>rigescens</i>	276
<i>exannulatus</i>	921	<i>Iterigynandrum filiforme</i>	70
<i>app V orthophyllum</i>	926	<i>Rhacomitrium canescens</i>	507
<i>revolvens</i>	283	<i>heterostichum</i>	370
<i>vernicosus</i>	248	<i>patens</i>	670
<i>uncinatus</i>	387	<i>Ptilium crista-castrensis</i>	396

Sphagnum compactum	441
capillaceum	478
Dusenii	451
fuscum	592
Girgensohnii	400 c 423 ✓
magellanicum	595
robustum	257
squarrosum	434
subsecundum	439
Warnstorffii	584
Splachnum sphaericum	249a
Scouleria marginata	256
Scleropodium obtusifolium	89
Scorpidium scorpidioides	453
Stereodon circinalis	518
cupressiforme	107
" var	164
reptilis	358
Timmia austriaca	144
megapolitana	361
Thuidium abietinum	630
blandovii	280
delicatulum	183
recognitum	132
Tortula ruralis	213
Tortella tortuosa	8
Tayloria lingulata	707
Ulotia Americana	12
Druschii	217

Notes from A. Bruckmann

#1000

95

- 1. *Conoclinium*
- 2. *Proserpinaca*
- 3. *Neoclethra*
- 4. *Stemodia*
- 5. *Yucca*
- 6. *Conoclinium*
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- 100. *Conoclinium*

39 kept

inserted in herb.

188 in all

Brinkman Herb._

A group of 21 specimens of hepatics of the genus Diplophyllum were found in the fungus herbarium and inserted in the General Hepatic Herb. in March 1982. Most of them were collected at Holberg on North Vancouver Island, 1932-37 by a Miss or Mrs Mackenzie (Miss C. E. Mackenzie?).

Brinkman published a paper on this genus in Bryologist 43: 38-45. 1940. I do not find his new taxon, *D. hyalinus*, among the specimens.

G.S.

NOTES BY MR. BRINKMANN

(to be kept for reference to Brinkmann's specimens)

(specimens are currently being revised by Dr. Bird, Calgary).

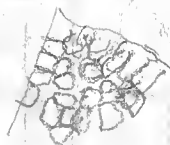
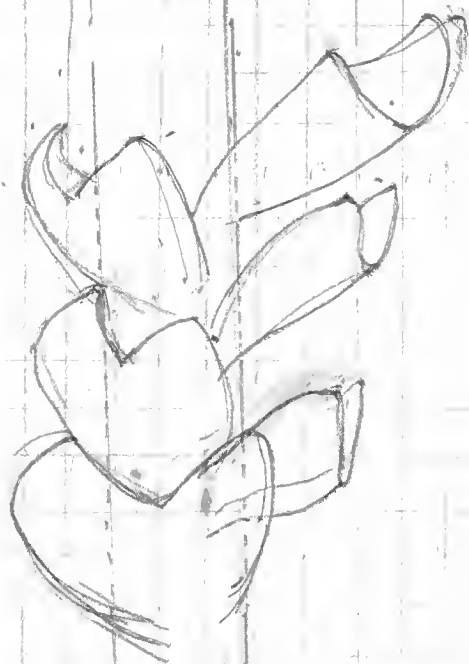
(June 1970, U.M.)

1200, 1000 and 810

Was not answered by myself as soon as it 2

5 and 6. - would like published in the same issue as above but as above not. - I hope to see it in the next issue of the Journal. - 50

? Fine. 1. vol. 610. 542. 1006 ?





3847. Probably the new *Sphenolobos*.
The Scapania one of the curta group with
decidedly thickened walls, 154-134

The inner almost as thickened, but not trigones
noticed. much like a small curta & probably
one of the curta group. gemmae rounded
to rounded angular? one cells
inner cells slightly larger. wine red
The per. of? Sphen new less plicate, &
the cilia rather longer. The bracts
mostly 3 fid, entire, & acute to apiculate.

45 x 1.35 3847a has also the Scapania
? glaucocephala, & has one? bract
4 fid-

3819a. Is good type, as 3864. The perianths
are narrower in proportion. 4.5 wide x
1.85 long in extent, there is a greater
range of leaf form. The typical one concave,
the sinus can be lunate in the less
concave leaves, while the smaller leaves
may have acute lobes as opposed to its
obtuse to subacute lobes of the majority
gemmae best forgotten, as they may
belong to Scapania. at seen under 1
perianth bracts usually 3 lobed, none
seen with teeth

Perianth 1.50 mm x 1 mm wide
lobulate. incurved at mouth
cells much as in leaves, but hyaline at mouth
the lobules broadly acute, some ending in
cilia 2-4 cells long lobules & cilia incurved
bracts 2-3 lobed with entire margins, to .8 mm wide
& the leaves beneath larger than those on sterile
stems gemmae from the edges of upper
deformed leaves, snow red, much as described
for *Hellerianus*, but no gemmiferous shoots seen
perianths may be as above to narrower & cylindrical
with a gradual drawing in towards mouth, &
Mahavastavata all differences between
65 SW mouths seem but about the
Mojave same, lobulate with
Visma lobes broadly acute

ending in 1 cell, to a few ending in cilia to 4
cells long

so far differences

are not spinousiliate ~~for~~ ⁰⁹⁸ ~~for~~ ¹²¹

& not spinous ciliate bracts

& no gemmae shoots

092

0948 1981

cells somewhat equally thick walled, irregular in
size, but averaging around 17μ , from 12 to 20
leaves before, lobes equal no trigones
suboblong, sinus acute, lobes close together
to $1/4$ mm long & almost as wide, quadrate in
outline cells papillose antheridium ^{20-25 μ} ~~20-25 μ~~
leaves concave cells same base to apex
lobes wide apart sinus acute to subacute
bract 3 fid entire
leaves ~~often~~ concave, & sometimes caniculate
sinus acute to obtuse, usually somewhat
connivent lobes subacute to obtuse
antheridial bracts more swollen (ventricose) &
more obtuse than ordinary leaves.
perianth mouth crenulate, up to ? 2 cells
long. leaves subquadrati to subtriangular
stipules frequent, long to near apex, hyaline
to dirty hyaline insertion transverse with
no sign of decurrency.

Sphenolobus sp. nov.

Plants in mats close to the soil, on earth or forest debris, to 3, occasionally to 5 mm long, bent. Dioecious. Leaves approximate to overlapping, somewhat secund. Bifid, broadest about middle, 2.5 to 3 mm long when mature, by 1.5 mm to 1.8 mm broad. Lobes obtuse to subacute, sinus open, ^{when wet} subacute to lunate. usually subacute. Leaves somewhat obliquely inserted, and secund.

Stem with numerous dirty hyaline rhizoids. ^{rather thick} Upper leaves none, except rarely one between the bracts. ¹ Cell walls firm, but without trigones, chlorophyll ¹ showing up rather plainly. ² Surface papillose, the papillae showing on both surface (looking down through microscope) and on edge on surface when folded.

¹ Cells variable in size, shape and arrangement, averaging around 18 mic. Border cells with a tendency to be quadrate. Very little larger in size below. ^{until near base} Anthridial bracts somewhat similar to leaves, but a little larger, and more saccate, the antherids single in the bracts, and large for the size of the plant, averaging 130 mic. Second pair of bracts, ^{or occasionally} a little larger than leaves, but otherwise similar. Bracts variable 2 to 3 fid, decidedly larger than leaves, sharp pointed to apiculate. ⁺ Perianth cylindrical to near top, where slightly or more contracted, into short plicae. Avg 1.4 mm long by .6 mm broad. Teeth numerous and coarse, and variable, from 1 to 3 celled in a single row, or much broader at base, frequently cut ~~into~~ into mouth of perianth.

~~dioecious~~, antheridial bracts terminal on all examined. Young shoots with smaller and more distant leaves, more acute.

Gemmae rare, angular, reddish, irregular in shape, from irregular round to irregular angular. Gemmae deforming tips of upper leaves. Avg 15 mic. (Note, lengths of leaves should be .25 to .3 mm long by .35 to .38 mm broad, shifting the decimal point.)

This seems to cover the common variations.

Type 3664, on forest floor, at Nordegg, ² Pine Forests. (Alberta) where not rare. ^{2 Aug 7 1928}

⁺ rarely 4 fid, separate to connate (see fig 1) + margin entire
being found in a number of different places in the district

leaves when dry with lobes strongly incurved.

The plant is interesting as forming a link between *Sphenolobus* & *Cephaloniella* and though large for the *Cephaloniella* the shape of perianth & the occasionally partly connate bracts partly bridges the gap between the two genera.

The plant has been confused with *S. Helleri* so the points of distinction are given below.

Affertinus
Perianth ^{teeth} lobulate, with short cilia few in number

Bracts usually 2, ^{fid} rarely 2 or 4 ^{fid}
with entire margins, lobes sometimes
spiculate, bracts occasionally connate
in part

^{bilobed}
Leaves concave with incurved lobes
lobes subobtusate to subacute, rarely
acute sinus lunate to acute

cells averaging 18, ^{little if any larger}
at base of leaves, ^{unequal in size}
& arranged ^{in rows} rather thick

walled but without trigones

Gemmae branches absent

Gemmae rarely on margins of upper leaves

Habit forest floor & floor debris

^{stellariatus}
Perianth lobulate with long numerous cilia

Bracts 3, ^{fid} (sometimes 4 ^{fid})
with few to numerous teeth

leaves caniculate teeth bilobed with
acute to acuminate lobes, sinus acute

cells averaging 17, very thick
walled, usually much larger at base
of leaves

Gemmae branches constant with
reddish tetrahedral gemmae

Habitat rather wood

phenolobus Albertinus sp. nov.

Plants in mats, close to the soil, on forest debris, or more rarely on earth.

Stems occasionally to 5 cm long, bent. Ploecous.

Leaves approximate to overlapping, somewhat secund, bifid, broadest above middle, .25 to .35 cm long, when mature, by .15 to .20 cm broad.

Lobes obtuse to subacute, veins open when wet, subacute to lunate, mostly subulate. Leaves somewhat obliquely inserted and secund.

Stems with numerous dirty-buff rhizoids. Underleaves none, except rarely one between the bracts.

Cells variable in size, shape and arrangement, averaging around 16 mic, until near base, where a few are to 20 by 30 mic. Border cell is with a tendency to be sub-quilate. Surface papillose, the papillae showing on both surfaces (looking down through microscope) and on edge or surface when folded.

Cell walls firm, rather thick, but without evident trigones; chlorophyll showing up rather plainly.

Antheridial bracts somewhat similar to leaves, but a little larger, and more succate, the antherids single in the bracts, and large for the size of the plant, averaging 1.0 mic. Second pair of perichaetial bracts a little larger than the leaves, but otherwise similar.

Bracts variable, mostly 3 fid, occasionally 2 or 4 fid, usually separate, occasionally connate in part (see Fig. 1) decidedly larger than the leaves, sharp pointed to apiculate, margin entire.

Perianth cylindrical to near mouth, where slightly or more contracted into short plicae; averaging 1.4 cm long by .2 cm wide. Teeth numerous and coarse, and variable, from 1 to 5 cells long, in a single row, so (usually) much broader at base. (see fig) frequently cut into mouth of perianth.

Antheridial bracts terminal on all stems examined.

Young shoots with smaller, more distant and more acute leaves.

Type XXXI on Forest Floor near Nordegg in pine forests, (Alberta) where not rare, being found in a number of places in the district.

The plant species is interesting as forming a link between *Sphenolobus* and *Cephaloxiella*, and though large for *Cephaloxiella*, the shape of perianth, and the occasional partly connate bracts partly bridges the gap between the two genera. The plant has been confused with *Sphenolobus* "ellermanus", so the points of difference are given below

<i>S. Albertinus</i>	<i>S. "ellermanus"</i>
Perianth lobulate with broad teeth and short cilia, few in number.	Perianth lobulate with numerous long cilia
Bracts usually 3 fid, sometimes 2 or 4 fid, with entire margins, lobes sometimes apiculate, bracts occasionally connate in part.	Bracts 3 fid, sometimes 4 fid, with few to numerous teeth
Leaves concave, bilobes, with incurved lobes, especially when dry; lobes subobtusate to subacute, rarely acute, sinus lunate to acute	Leaves caniculate, bilobed, with acute to acuminate lobes, sinus acute
Cells averaging 18 mic, rather thick walled, irregular in size and arrangement, not much larger, or till near base, where a few are 20 by 30 mic.	Cells very thick walled, averaging 17 mic, usually much larger at base of leaves
Germose shoots absent	Germose shoots always present, with numerous red tetrahedral gorms
Habitat Forest floor and floor debris	Habitat rotten wood

I am returning Sphen. Beller they should have been sent long ago but I felt you would have let me know if you wanted them. I am retaining the new species until published it definitely is not *Hellerianus*. Some of the packets were in very small quantity & in a few cases where I could not find what looked like *Hellerianus* with a lens I left them alone, nearly all however have been examined. You will find notes on some of the packets not enough to do justice. The two European plants, Persson & Arnell, I have picked out perianth from, & enclosed them in small packets I have used them largely for reference along with *macvicar*.
1241. C. C. Haynes, Desert Mt. I should say definitely is not *Hellerianus* while it is off type I think it may be put under *S. minutus*. It is off type, but *S. minutus* is a very variable species, as *minutus* var. *unspicata* while another var. var. *obtusifolia* from New Territories ought to be published. The two packets of *Victoria* seem practically all *Jamesoniella*. No 10 I found like *Hellerianus*, no 2, a few stems. No 92. C. C. Haynes, Coll. G. P. 6, no *Hellerianus* seen but there is a plant apparently new to science. The underleaves separate from *sphenolobus* or *Diplophyllum*, it seems to come under *Lophocia* perhaps nearest to *Kunzeana* but not very near at that, see note inside. I have picked out a few stems & sent to Miss Haynes, & must try to separate out a few again, there seems to be one perianth but as there is only one, I have undisturbed. It may not be the new species as the packet is mixed. Went again over the packet trying out the plant with the real gemmae. The plants I examined would seem to come near *L. heterocarpa* but I found no clear n l the gemmae are round to irregular & are distinctly reddish so I put the material back again having failed to find the plant I wanted in the part I examined & being very uncertain in my mind just what the plant I examined was. I would with considerable hesitation call it *heterocarpa* forma. *longirostris* has somewhat the same form & recurvity of leaf but my material is rather greenish than brownish & here again the gemmae don't seem to fit tho the work of n l agrees with *longirostris*.
I was under the impression I had a letter of yours unanswered, but I cannot find it among my unanswered correspondence. I see from some of your printed material that you have kept yourself very busy, but the tricky *Lycium* group are almost unrepresentative in Canada or in the West, so the paper does not make a direct appeal, while the treatment of *thyroanthus* must have been an expansive one fig 1-51. I take it to be a trifling genus. Thank you for the opportunity & privilege of examining the herbarium material of *S. Hellerianus* it helped clear up the point of relationship. Were you ever able to go over the Asotia material & compare with a *californica*. It seemed sufficiently different to leave doubt as to its being that species. A most unpleasant winter here & it helps neither work or study, but we have to take it. Cincinnati is at least warmer tho they have their troubles with floods sometimes something that never touches the prairies. The war seems to be stretching its hands widely, taking in botanists also, & one misses them. yet one would hardly wish it otherwise until the war is over, war is finished. God grant there is sufficient wisdom & unselfishness to make a lasting peace possible.

If Macvicar's figures are taken as a basis for comparison the following points stand out. All the specimens examined were from wood, all had gemmiferous stems, which however varied in abundance from plenty to very few, so few that considerable examination was necessary to find them. While always the involueral bracts were serrated, irregular serrate the figure by Macvicar shows the extreme form from there they varied to frims with fewer or smaller teeth often both, but no bracts were found that were quite entire.

Macvicar figures the leaves as equally bilobed, runcinate, acute to acuminate that seemed constant on well formed stems, but it was not unusual to come across depraecinate specimens where the leaves were very small, as small as or smaller than a small *Cephaloxiella* & in such cases there was also a very considerable amount of variation in shape, rarely a few lobes would be obtuse, but the sinus could be acute to obtuse, with almost parallel to wide apart lobes.

Macvicar gives the cells as 16-24, I found them averaging 17 at 9 near open getting longer near base, where from 20-25. irregular in size & arrangement, & always thick walled, but with no trigones. While occasionally gemmae shoots were as figured by Macvicar, it was frequently the case that they were with the stem, & below more like the leaves on ordinary stem, his fig 3 of stem does not show the common form here. The occasionally met with, ~~the~~ ^{the} gemmae like the lower leaves shown in figure stem. The perianth, bilobate & hooded, normally had the teeth extended into calyx up to 8 cells long, but there was considerable variation of the character, some showing fewer & shorter teeth, but teeth seemed always present, & they seemed to be somewhat flinate & incurved above. The gemmae we quite frequently better developed than shown of figs of Macvicar, but attract attention mostly by their bright red colour.

a 157
132 a

scandens
20/22
128 a

lingulata
22/1
128 b
lingulata
13 a

13 a
15 m
129 a
lingulata

14
147
proctensis
15/1
20/1
larger
distans

grace

Zaremba
plant

papillosa

714-763
in V

forma
legumosa
paludosa
714-763
Rosa

type

paludosa
sarpapillosa

papillosa

lost
Hall specimen

[illegible]

Nardus g. way, has	5	
Loph. longistylis	5	
Loph. longistylis	5	
S. minus cuspidatus	5	
L. badensis	1	
L. ventricosa	5	
Plas. arifolia	5	P E S H
Loph. Binsteadii	5	a P E

Jungernannia, N Sp

Autoicous, male bracts some distance below perianth.

Leaves, small below, .35mm, enlarging gradually above till bracts are reached.
-Bracts, .8 wide and .8mm broad.

All broadly ovate, broadest at or below the middle, gradually coming to an obtuse or obtusely pointed apex. Concave.

Insertion, transverse, ~~is~~ distinctly narrower at point of insertion.

Cells, thin walled, but with minute trigones. Above averaging 19u, irregular (varying between 13 and 23u) gradually but slowly enlarging towards base of leaf in centre, where averaging 18 by 30u, but on the outside of leaves at base, very little larger than apical cells. Surface verruculose.

Rhizoids, numerous on stems and innovations.

Perianth usually lateral by innovations, from horizontal to suberect, but curved, usually ventricose above ~~1.2mm~~ 1.2u long by .75mm wide, broadest below to a point about 2/3 of length, where gradually contracting to a small mouth, which is .2u wide, and with numerous crenulations crowded, short to 2 cells long. Upper part of perianth plicate.

The male bracts more concave than the leaves, shallow basin shaped.

Jungermannia, N Sp

Autoicous, male bracts some distance below perianth.

Leaves, small below, .35mm, enlarging gradually above till bracts are reached.
-Bracts, .8 wide and .8mm broad.

All broadly ovate, broadest at or below the middle, gradually coming to an obtuse or obtusely pointed apex. Concave.

Insertion, transverse, ~~no~~ distinctly narrower at point of insertion.

Cells, thin walled, but with minute trigones. above averaging 19u, irregular (varying between 13 and 23u) gradually but slowly enlarging towards base of leaf in centre, where averaging 18 by 30u, but on the outside of leaves at base, very little larger than apical cells. Surface verruculose.

Rhizoids, numerous on stems and innovations.

Perianth usually lateral by innovations, from horizontal to suberect, but curved, usually ventricose above ~~1.2mm~~ = 1.2mm long by .75mm wide, broadest

below to a point about 2/3 of length, where gradually contracting to a small mouth, which is .2mm wide, and with numerous crenulations crowded, short to 2 cells long. Upper part of perianth plicate.

The male bracts more concave than the leaves, shallow basin shaped.

Juncus *lambertii* # 1 Nov

Plants pleurocarpous through numerous innovations beyond female inflorescence
aristate, arthroid bracts some little distance below perianth.

Plants small, usually under 1 cm long. Leaves frequently subsecund (refer to
Lacvicars plate of *J. atrovirens*, Fig. 1) but sometimes biplaneate.

Leaves broadly ovate, clasping stem, attached much as in Figs 1 and 2 under
J. sphaerocarpa, by laclicar, concave, usually largest just below perianths,
where up to 1.3 mm long and 1.65 broad, smaller below. Attachment oblique, narrowed
to insertion to .3 mm. The leaves broadest below middle, narrowed above
to a rounded apex. Cells, apical averaging 10 μ , rather irregular (12-20 μ)
in line, somewhat thick walled, with small trigones. Gradually larger below,
at base in centre up to 30 μ \times 18 μ but at margins distinctly smaller and
more isodiametric. Surface verruculose.

Perianths oblique by continuance of innovations; 1.30 mm. long, by .8 mm
wide at or about centre, which is swollen to ventricose. Length .2 mm wide
deeply plicate, with numerous long celled crenulations, 1-2 cells high, base
obovate. Rhizoids numerous on stems

Type, Canyon Creek, Monte Vista Dam, Placer Co, California, July 11, 1923,
Collected by A. MacGillivray. In Herb MacGillivray

Jungernannia # 3p Nov

Plants pleurocarpous through numerous innovations beyond female 1.
autoicous, anthridial bracts some little distance below perianth.

Plants small, usually under 1 cm long. Leaves frequently subsecund (refer to
Macvicars plate of *J. atrovirens*, fig 1) but sometimes biplantate.

Leaves broadly ovate, clasping stem, attached such as in Figs 1 and 2 under
J. sphaerocarpa, by Macvicar, concave, usually largest just below perianth,
where up to 1.4mm long and 1.05 broad, smaller below. Attachment oblique, narrowed
at insertion to .3mm: up to .4. The leaves broadest below middle, narrowed above
to a rounded apex. Cells, apical averaging 19 u, rather irregular (13-24 u)
in size, somewhat thick walled, with small trigones. Gradually larger below,
at base in centre up to 30 X 18 u. but at margins distinctly smaller and
more isodiametric. Surface verruculose.

Perianths oblique by continuance of innovations; 1.30 mm long, by .8 mm
wide at or about centre, which is swollen to ventricose. Outer .2 mm wide
deeply plicate, with numerous long celled crenulations, 1-2 cells high, base
.3 mm. Rhizoids numerous on stems

Type, Canyon Creek, Monte Vista Dam, Placer Co, California, July 11, 1941,

coll. H. H. Keck & J. D. In Herb. MacGadden

Jungermannia N Sp.

Plants autoicous, branched, usually under 1/2 cm long minute.

Leaves smallest below, enlarging upwards. ~~Smallest~~ .35mm long, usually broader than long, broadly ovate, broadest at or below the middle. Gradually coming to an obtuse apex. Concave. Somewhat obliquely inserted below, but nearly transverse near the perianth, as are also the male bracts. Usually the leaves are subsecund above, ~~nach~~ as in MacVicar's plate of J atrovirens. The leaves clasping stem, but not at all decurrent. Cells irregular above averaging 19u, varying from 13 to 23u. somewhat thick walled from contents clinging to walls. Minute trigones present. Basal cells in middle up to 18 by 30u, but not much larger than apical at margins. Surface verruculose.

~~Perianth~~ Rhizoids numerous on stems and innovations, colourless.

base Perianth usually lateral by innovations, from horizontal to suberect, ventricose ~~above~~, 1.3mm long by .75mm wide. Broadest at or below middle, plicate from there above, gradually contracted to a narrow mouth .7mm wide, the mouth with numerous crenulations, short, to 2 cells long.

Male bracts some distance below perianths, deeply concave, and transversely inserted. Bracts below perianth up to 1.1mm long by 1.05mm wide, Perianth at base .3mm wide.

Stem in section with outer row of cells, rather thick walled, 25 x 30mm, internal cells thin walled, abruptly differing from outer row. Averaging 15mm wide.

nearly hyaline *outer cell* walls distinctly verrucose Type, Canyon Creek, Monte Vista Dam, Placer Co, California June 11th 1922 Coll F A MacFadden, in herb MacFadden.

The continuous innovations give the plant a pleurocarpous character, and the perianths are sometimes curved.

The irregular cells are very similar to those of J atrovirens, to which the plant seems closest in relationship, but that plant is dioecious, ~~with~~ *while* perianth is ovate to oblong-ovate, but is variable in shape; it however does not appear to have any tendency to approach the ~~shortly-attenuate~~ *mouth* pointed of the above. The stem in section shows smaller ~~cells~~ *internal*, and while the outer are nearly as large as those of above, the inner are distinctly larger, averaging 20mm, and not ~~marked off~~ *sharply* from the outer row.

The perianth of J ~~pumila~~ *makes* has some approach to that of above, but is more longly attenuate, and less markedly crenulate at mouth, also it is nearly always terminal in appearance, and shows no sign of being ventricose above, being rather fusiform. The leaves are larger, and while the ~~apical~~ *radical* cells are not markedly larger, they are less irregular, more noticeably thin walled, and below they are distinctly larger, mostly some 50u long, or even longer. The marginal row is rather distinctly marked off.

The cells In stem section the ~~J pumila~~ show but little tendency to differ, and though the outer are larger, 25 x 30, the ~~inner~~ *inner* are also larger than above, some 17u, gradually mixing with outer row, not distinctly marked off. They are also distinctly firm walled.

J Schiffneri has a different perianth, the male bracts are directly below the perianth, the leaves are distinctly different on the infertile branches from the broader than long leaves of the fertile stems.

It has to be remembered however that other of the Californian Jungermannia are variable, thus J Schiffneri from there has larger cells than usual, and a longer perianth, though variable perianth is also noticeable from material collected in B C and Alberta. Then ~~J pumila~~ *Californian* had not the longly attenuated perianth usually found on European material.

J Bolanderi is distinctly different, and the large decurrent leaves with "upper leaf cells 25-40u, and basal 45-96, will easily mark off from above.

J panicola is described as perianth obovoid, exserted, irregularly plicate towards the abruptly contracted, at first crenulate-denticulate mouth. The cell size given is larger also, 24-50u.

J riparia has larger cells, more ~~thick-walled~~ *thin* walled, smaller trigones cells, more regular, the perianth is quite different, though it is variable in size and shape, none being seen however with the attenuate mouth of the above. *It is usually a large plant*

A plant from California, Coll E C Suteliffe, Oct 1927, Plate Flat, Sierra Co, is so near the usual material of *J atrovirens*, that it appears to fit well enough there to be quoted as an addition for California. That ^{plant} is at first sight similar to above, but the few perianths found, though immature, or else imperfect, are distinctly different, also the stem section is similar to that of European *J atrovirens*, and the plant seems dioecous. Male plants found with no ~~antheridia~~ archegonia, and perianth bearing plants showing no sign of antheridial bracts.

Jungmannia A. sp. *macfadense*

Plants autoicous, branched, usually under 1/2 in. long,
minute.

Leaves smallest below, enlarging upwards. 3-ranked. 1st row, usually broader than long, broadly ovate, broadest at or below the middle. Third row coming to an obtuse apex. Concave. Slightly obliquely inserted below, but nearly transverse near the perianth, as are also the male bracts. Usually the leaves are subequal above, such as in *J. aculeata*'s plate of *J. striatirens*. The leaves clasping stem, but not at all decurrent. Cells irregular above averaging 15u, varying from 10 to 20. Second & third walls from contents clinging to walls. Minute trigones present. Small cells in middle up to 10 by 10u, but not much larger than a cell at margins. Surface verruculose.

Perianth: bracts numerous on stem and innovations, coriaceous. Perianth usually lateral by innovations, from horizontal to suberect, ventricose above, 1.5-2 in. long by .75 in. wide. Broadest at or below middle, truncate from there above, gradually contracted to a narrow mouth .125 in. wide, the mouth with numerous crenulations, here, 1.5-2 in. long. Male bracts same distance below perianth, deeply concave, at base very abruptly inserted. Bracts below perianth up to 1.5 in. long by .125 in. wide, coriaceous at base .5 in. wide.

Stem in section with outer row of cells, thicker than walls, and with internal cells than walls, sharply contrasting from outer row. Perianth 1st row.

Stem: 1st row of cells, thicker than walls, and with internal cells than walls, sharply contrasting from outer row. Perianth 1st row.

The continuous innovations give the plant a pleurocormous character, and the perianth are sometimes curved.

The irregular cells are very similar to those of *J. striatirens*, to which the plant seems closest in relationship, but that there is a difference, with perianth 1st row ovate to oblong-ovate, but is variable in shape, and never seems to have any tendency to approach the horizontal position of the above. The stem in section shows smaller cells, and the outer are nearly as large as those of above, the inner are much smaller, averaging 10u, and not marked off from the outer row.

The perianth of a female has some approach to that of above, but is more largely subcordate, and more markedly crenulate at mouth, also it is nearly always coriaceous in appearance, and shows no sign of being ventricose above, being rather flaccid. The leaves are larger, and while the perianth cells are not markedly larger, they are less irregular, more noticeably thin walled, and below they are distinctly larger, at base 1.5-2 in. long, or even longer. The marginal row is rather distinctly marked off.

In stem section the female shows but little tendency to pleurocormous, the outer are larger, and the inner are smaller, and the outer are more distinctly marked off from the inner row, not distinctly marked off. The outer are distinctly thin walled.

A different form is also present, the male bracts are broader than the perianth, the leaves are distinctly different in the inferior part of the stem, the broader than long, widest at the middle of the stem.

It has to be remembered however that other of the collections made at the same place, that a different form from there has larger, or cells, like above, but a larger perianth, though variable in shape, and a different form collected in 1880 and 1881. The plant is like the one longly strobiliferous perianth usually found on the stem lateral.

A different form is distinctly different, and the large outer row leaves with 1st row leaf cells 15-20u, and basal 10-15u, with easily marked off the base.

A different form is described as perianth above, exerted, irregularly truncate towards the abruptly contracted, at first crenulate-dentate to mouth. The cell base given is larger also, 15-20u.

A different form, larger cells, more ~~thick-walled~~, thin walled, and the outer cells in size and shape, none being seen however, but the outer cells are of the above

A plant from California, Coll. E. C. Muhliff, Oct 1907, Lake Flat, Sierra Co, is so near the usual material of *S. atrovirens*, that it appears to fit well enough there to be quoted as an addition for California. That is at first sight similar to above, but the few perianths found, though minute, or else in part, are distinctly different, and the stam section is similar to that of European *S. atrovirens*, and the plant seems dioecious. Male plants found with no ~~antheridia~~ archegonia, and perhaps bearing plants showing no sign of antheridial bracts.

Jungmannia pumila. The apical cells not much differing in size from
walled, trigones ^{Knights} ~~not~~ ^{slender} minute. The basal cells decidedly larger, up to 50 μ
& occasionally beyond. Stem cells 25+30, inner 16-17, firm to thick
walled, dark-green almost as much ^{dark} coloured as outer. rather rapidly
enlarging. Leaves longer than ~~new~~ & oval not as broad as long
perianth longer & narrower, to 2 mm \times .75. gradually tapering above to
a mouth 1 mm. The cells variable above, sometimes nearly equal,
sometimes unequal, with a rather well defined marginal rib.
Distinctly larger basal cells, larger leaves more oval stem structure also
different & perianth decidedly different in shape, no signs of ventricose, &
seemingly terminal, on all examined.

J. atroviens, Pearson Jones Guen. The cell structure differs but little
in size & irregularity from the new one either basal or apical. The
leaves may be as broad in proportion. The stem has outside 25-30,
inside, 20+ & no marked difference, the plant seems dioecious.
There is considerable variation in leaf size & width & no differences can be
laid down as white usually oval they may be on occasions much ~~than~~ ^{than} tall &
white small below, gradually become larger above. The leaves seem decidedly
more oblique below than in the new. Plant seems dioecious, what seems like
terminal male bracts or an antherid being found.

Plate Lat. Series 60. Differing from 8936 in perianth which, white
variable show no sign of being ventricose in stem
subulate. *Calliandra* which has cells not markedly larger tho less thick
walled than in Jones plant & is being? dioecious.
no sign of male bracts. Cells much of atroviens shape, size of leaf etc,
& shape variable. immature to over-mature perianths: all erect. One with
toothed mouth, immature seems crenulate, & one so long as almost to
suggest Howe plant.

8936. The cell structure & minute size may suggest *atrovirens*. The cells are irregular in size & appear thick walled from chlorophyll clinging to them but are really firm walled with minute trigones. The colour is greenish, not blue green & the leaves distinctly wider, usually wider than long, making in that respect some approach to *J. schaffneri*.

Leaves somewhat oblique below nearly transverse above & subsecund. cells of perianth slightly larger, avg 21. irregular, firm walled, but trigones usual none. cells of stem isodiametric, avg 30 green. inner stem cells long, narrow, 11 μ dia hyaline. Good section. Inner cells avg 15, 11-20 thick walled, almost hyaline. Outer layer abruptly longer, avg 25, thicker walled, outer layer verrucose.

- 1018 1819 as 1018
- 19 1020 Differs in leaves from a broader base, with narrower cells more sinuose, the thicker cell walls making the cells appearing still narrower.
- 20 Infl seems synoicous. inner peristome more appendiculate, outer cells without the well marked projections, of 1019 1019. short necked.
- 22 Teeth deeper red
- 23 inner peristome not better developed than 1018
- 24 Lid seems with a tile series of outside cells 3 rows
- 25 1021 Lid with a row of elongated cells, annulus not composed of a row of long cells on a row of shorter cells but with a double row of irregular cells, with a row of rather short & somewhat irregular cells.
- 26 Dioucous, no antherids found in many flowers.
- 27 Leaves ovate, usually widest at or above the middle, cell rather wide, rather thick walled, border plain, recurved in older leaves, & appressed so as to seem double bordered.
- 28 Outer peristome bryoid, inner peristome not well seen, outer peristome possibly of double teeth.
- 29 1024 Almost pure B. Brinkmanii, with a few stems of, ("Pseudo-triquetrum")
- 30 occasional plants of the other associate Bryum, ("Bulbosum")
- 31 1024 Almost pure B. Brinkmanii, with a few stems of a pseudo-triquetrum
- 32 & occasional stem of B. Bulbosum
- 33 1022 a plant that seems intermediate between Pseudo-triquetrum & Brinkmanii, with capsule much like latter, but differing in the 5 or more
- 34 rows of small cells at top of capsule & rather pale teeth compared to one or two rows of small cells in Brinkmanii & very deep red teeth.
- 35 Wide leaves, large & wide celled, border not as pronounced separates from ordinary triquetrum.
- 36 a fourth species of Bryum all present
- 37 1023 *Barbula rubella*
- 38 1026 seems *Lottia inclinata* but with ? 16 bifid to trifid perforated teeth from a membrane two or three cells high, all coarsely & irregularly papillose or warted, teeth about six cells high, ? broken.
- 39 1025 mixed with an amblystegium (as 1027), & ? a Plagiothecium, with leaves falcate, the falcate portion, crossing the main portion of the leaf, point, long but not attenuated, auricles well defined of quadrate, but not hyaline cells, & the bottom cells rather wider & shorter, nerve about third of leaf.
- 40 1026 *Lottia inclinata* with peristome & spores bottom, but not at all, cells rather broad & thick walled, more quadrate at nerve about 1/4 of leaf point rather long & almost straight.

1075 Leaves, thick nerved, upper portion of leaf all nerve, roughened, coarsely
1078 papillose, lamina, narrow at first, but rapidly expanded at base, net
1079 auricled. Cells irregularly quadrate, rather rapidly narrowing & length-
1086 ening in expanded portion, not papillose. *Swartzia inclinata*
1089 Capsule globose, with 16, double perforated teeth, deep red. 1078
1085 1075

1091 Bryum, Leaves narrowly bordered, nerve excurrent, border usually recurved
1090 below. Infl synoicous. Capsule, narrow, straight, teeth perfectly bryoid,
with inner peristome well developed, plainly appendiculate.

1073 Bryum, Leaves narrow coiled with border of narrower cells, plane
or slightly recurved. Nerve longly excurrent, spinulose, secundly each
surface cell extruding in a curved point.
capsule sub lobose, usually co stricted below mouth, surface in use.
teeth irregular inside cell, usual outside cell plates, inner peristome
ciliate & slightly appendiculate, separate from outer peristome.
infl ? dioicous, (no antherids found)

1086 Leaves linear-lanceolate, acute, nerve percurrent, or ceasing just below apex
in a few cells. Point of leaf serrate. Cells quadratish, rather pottied,
but with the cells at base long & narrow. Margin plane.

Infl autoicous, with two or more flowers, (up to four)
Cells roughly papillose, papilla ? double, nerve possibly smooth
(mixed with *Pottia ? inclinata*)

1089 *Pottia inclinata*. Leaves plane or ? narrowly incurved, with a plain
border of narrower cells, starting near top of leaf & going to bottom of
leaf. Cells slightly papillose. Nerve percurrent, or nearly so, point
abrupt, usually of a few cells. Leaf somewhat concave, rather rotund, to
ordinary pottia shape. Infl ? dioicous, capsule without peristome, inclined,
one row of small cells below lid. Lid rather long pointed, point
inclined.

1085 *Pottia inclinata*. Infl plainly synoicous. Border of leaf seems
narrowly recurved

1018 Bryum, near 1075. Capsule more lobose, not markedly long, 2 teeth
red at base, not pale, teeth also markedly saw shaped inside cells,
making inside face seem appendiculate. Lid mamillate.
Nerve smooth or almost so. Leaves usually recurved, at least below, cells
rather wide for Bryum.

Differs from 1075 (capsule assymetric) in symmetrical capsule, with
shorter neck, making a small rather wide capsule, but like that in pecu-
liar outgrowths in cells of teeth.

1028 ? Same as 1075, immature

1029 *Punaria hygrometrica* with small portion of bryum ?

1030 c same as 1027 an *Amblystegium*, but rather larger leaves & more serrate along with a bryum that has rather wide cells & narrow base, with *luvalii* habit

1031 possibly *Brachythecium albicans*

1034 seems same as 1027, but in good fruit, & synoicous, though antherids & archegonia small.

1035 bryum rather wide cells, border of narrow cells, rather narrow. border narrowly recurved from just below apex to base, point excurrent, sometimes percurrent, not longly excurrent, usually slightly serrate at apex of leaf. Leaf widest just above base. Synoicous.

Capsule long, with pointed lid: not mammilate, teeth pale, slightly punctate, inner peristome well developed, annulus of two rows of elongated cells, lid with a row of longer cells at margin, border of capsule with two rows of rather smaller incrassate cells.

1032 *Harpidia*, with *crannulatum* auricles, but entire leaf, no serrations, & very narrow cells. Nerve not up into acumen, slightly plicate, & falcate, not, or not markedly pinnate.

1033 ? same as 1027, but habit as a *Stellatum* group.

{ 1091 ? same as 1035 but with smaller capsule, & point more excurrent, synoicous, inner peristome ? as only parts seen

{ 1092 dioecous, no antherids found, though female plants common.

Leaves wide, concave with wide cells, no narrow cells at border, usually plane border. Very small leaves. point rather abrupt from obtuse leaf apex, usually not longly excurrent, & often only composed at top of one layer of cells. Capsule very small with no neck, peristome perfectly eu-bryum. thought at first an immature bryum, but seems perfectly developed.

1036 seems as 1035 but lid about mammilate

1037 Mixture of 6 species. *arbuta* to *baea*, *rubella*, *ryum*,? same as 1035 etc, a *Webera*, a ? *Pieranacea* or *Leptobryum*, & a ? *Orthofentium*.
1038 *Lottia* *seimii* & ? dry form of 1032, but with less distinct auricles, less inflated.

1039 seems good *B. rubella*, with well developed peristome.

1040, *animum* ? *cuspidatum*

1041 *Amblystegium*, in good fruit, seems same as others, but larger leaves, more widely ovate, cells distinctly narrower, but with some branches much as the others, & with it another with falcate leaf points, & as narrow cells as most narrow of *Amblystegium*, shiny appearance, but not apparently otherwise distinct without fruit. A little *Bryum* ? *pseudo-triquetrum*.

1042 ? same plant as last of 1041, but darker, & with the nerve usually stronger.

& *Bryum* ? *pseudo-triquetrum*, with ovate to widely ovate leaves, wide cells, sometimes almost quadrate to well past middle of leaf, narrow border of cells, but variable, at times almost absent, leaf plane to lightly recurved to leaf apex, nerve usually slightly excurrent. ? *fiocous*.

Mid seems of double cells, giving it the appearance of tiling, peristome rather pale, inner peristome seemingly not appendiculate. Annulus double row of rather short cells on narrow border of small incrassate cells.

Capsule gradually, not abruptly bordered with small, not incrassate cells. Capsule long necked. Spores seem to be markedly larger than usual with *Bryum*, & finely spinulose.

1033 ? *Harpidia* or *Stereodon*, with small but well defined inflated auricles, occurrent leaves, auricles often torn off, base deeply rounded.

Cells distinctly narrow. Nerve to above the middle, acuminate, falcate, rather broadly ovate leaves. Also *Bryum* ? *Pseudoatriquetrum* & *Leptobryum*
&

1082 Amblystegium, with short nerve, long narrow leaves, usually serrate, cells rather wide, those in corners usually quadrate. A few stems with broader leaves, & rather longer cells, but seems grading into other. a capsule with an areola on it.

1083 Brachythecium, widely ovate leaves, with few plain quadrate cells at corners, cells fairly narrow, nerve short, leaves rather long pointed & serrulate. Amblystegium as above, a few stems with widely ovate leaves with longer nerve, & short, but somewhat narrow & sinuose.

1084 same as 1078, but not in fruit, with hyaline points, through dryness

1085 ? Harpidia aduncum V. aquatica, auricles of that group, & no sign of teeth, long flexuose point, & nerve to about base of acumen

1096 Amb ? confervoides, with obscure nerve, short pointed leaves, & cells nearly as wide as long, rather more quadrate at angles, with it a plant with longer & larger leaves, longer cells, more nerves, but seems an Amb, rather serrulate at margins.

1092 & 1093, both with rather wide cells, & teeth seen of usual pattern, not pendulous, ? is air in teeth cause of markings, or possibly membrane markings. Capsule such as 1078, & plants otherwise not much distinct from it, leaves rather wider near middle perhaps

1092 rather larger capsules & showing in some teeth the markings before referred to, at base of teeth, in any case the teeth are not of ordinary construction, being plainly divided into at least two divisions, the cells narrower, but I doubt whether it can be separated from 1075 clearly except when in fruit.

1095 Seems same as 1075, the teeth plainly appendiculate, cells rather narrower than usual, (see remarks above)

1091 & 1090, broadly ovate leaves with strongly serrate, at times spinose teeth, serration to near base usually, cells long but not too narrow, nerve about halfway up, leaves plicate. Fern with long flexuose points.

1099 Dicranum, with wide base suddenly contracted about third up to a very narrow & incurved lamina of small obscure quadrate cells.

Below cells long, narrow & hyaline, nerve rather narrow. cells above serrate, lamina ceasing below apex, which seems serrate all round strongly curled when dry, flexuose when moist

1100 Anium with rostratum leaf, but decurrent, nerve ceasing below apiculus, points very sharp, usually reaching about half way down, unknown

1101 leaves rather broad pointed, serrate to or near to base, nerve to about half way, leaves somewhat plicate, cells rather wide for rachy leaves somewhat decurrent, almost cordate at base with a few rather plain quadrate alar cells reaching almost to nerve. ? distinct

1044 Bryum, same as 1042. double layered lid & all, but not quite so well marked cells & leaves, & wall cells incrassate, but otherwise same, under mouth of capsule, also a little Leptobryum?, with rather obscure nerve, but bottom small leaves bryoid, & with round brown bulblets on roots.

1045 Amblystegium, ? same as 1027, & a little of plant ? same as 1033

1046 Parbula rubella

1047 ? dwarfed 1027

1048 ? Amblystegium serpens, nerve strong, to near apex, & broad below, leaves smaller, cells much about same, & P inclinate with good peristome. peristome membrane about 3 cells high, & teeth to 8 cells high, bifid to trifid, filiform, but usually variously joined below, densely & closely papillose

1049 Pottia inclinata as a ovc. With Amblystegium, (? serpens) as above, & a Bryum with pendulum structure of teeth, small mouth, & conical lid, No inner peristome noticed. Lid double, tiled, annulus cells seem superimposed, from a narrow row of incrassate cells, red. ? double annulus corresponds to double lid. Leaves much of caespitium type, rather narrow cells, well defined border, revolute to near apex, nerve bent variously, strong, well excurrent, almost smooth

1050 Seems Annum rostratum

1051 C Brachythecium salesbrosium, but leaves rather more widely ovate, not so long a point, & nerve not so strong.

1052 Pottia Heimii & a circinate leaved plant with broad base & plain though usually dark auricles, & rather narrow cells, nerve broad at base but not much above base of point. Also ? Amblystegium

1054 C Pottia inclinata, well developed peristome

1055 B Brachythecium, but shows little if any inner peristome. Lid seems to be layered with a third layer ? inside annulus. Annulus two layered from a layer of interrupted incrassate reddish cells

1056 Pottia inclinata, variable in size & length of capsule seta, size of plant

1057 C pendulum, seems same as plant in 1049, with thick bent nerve also a Bryum, One capsule of Bryum shows not pendulum. Hypnum with incrassate quadrate cells gradually at bottom, no marked auricles except

1058 Pottia inclinata, c/pr one with inflated cells hyaline. Circinate

1059 ~~Brachythecium~~ Parbula rubella & Brachythecium, seems near clausum, with very narrow areolation, marked auricles with quadrate pellucid thickwalled cells.

1059 Brachythecium with wider areolation, rather wider leaves, cells laxer at base, but hardly with auricles, & Ceratodon & Leptobryum, with bulblets

1060 Leptobryum & a little Bryum with well marked appendicular cilia, & contracted below mouth, leaves hardly recurved, about plain with narrow row of narrow cells to near apex or sometimes not existent, nerve percurrent or shortly excurrent. Also Amblystegium

1061 Amblystegium, with wide incrassate cells, no alar ones, leaves rather falcate, nerve broad but soon disappearing, border of leaf with cells projecting all round.

1062 Seems same as 1059 in fruit Bryum, with pendulum inner cells of peristome, inner peristome not seemingly appendiculate. Leaves broadest just above base, well marked margin of narrow cells, closely recurved, so as to seem bistratose, cells fairly broad, point almost smooth, excurrent.

1063 Bryum of alpinum group, usually wide celled, with almost obtuse leaves & nerve bent & percurrent, with plane margin & no narrow cells, but sometimes nerve slightly excurrent, apex boat shaped, sometimes a border of narrow cells

QTYT1065 ? same as 1063, swamp form, with leaves less appressed, usually sharper pointed, with narrower cells with often a narrow border, but all these characters are variable, it seems as above. With it an hypnum leaf broadened out from a narrow base, thick nerve, soon vanishing, below apex, point falcate to circinate, alar cells not well marked, but quadrate & incrassate, cells narrow.

1067 as 1063, well marked, with a strong tendency to reddish.
1064 Funaria, Leptobryum, & a little Amblystegium ? minutissimum, leaves long lanceolate, ecostate, or faintly nerved, cells fairly long, border of leaves serrate, leaves rather falcate.

1066 E. rubella & Leptobryum

1068 ? Amblystegium, with points often coarsely serrate. Border more or less serrate, cells narrow, no marked auricles, but a few quadrate cells gradually ? adnatum.

1069. ? same as 1076(?) synoicous, long capsule, border strong cells wide leaves widest about or above middle, well appendiculate, leaves recurved borders. Ceratodon, & Brachythecium, ? glareosum, no auricles, long point, rather twisted & serrate, few quadrate cells gradually at corners, nerve poor, somewhat plicate.

1070 ? Marbula. leaf apex very variable, acute or acuminate to broadly obtuse, leaf cells pellucid, very thick walled, basal, leaves cell more obscure, margin usually recurved on one or both sides to above centre, never to middle, apex toothed irregularly. nerve always ceasing below apex, leaves crowded on stems, stems tomentose with root hairs well up, cells with a single conical to acute papilla, usually hyaline, at least at apex, giving leaves rather a saw like appearance, nerve also with same kind of papillae. & Bryum, ? same as 1073, young leaves broader, broader cells, margin not so strong & not recurved. & Brachythecium, autoicous, with ovate leaves, somewhat serrulate at margin, long pointed, point serrate, nerve less than half way. Cells long & narrow, pellucid, few cells at auricles quadrate, rather plain. Nerve rather short broad & very long pointed serrate points, male, such as ordinary leaves. & a little Amblystegium

1071 ? same as above, but leaf points more incurved, in fact channeled, & cells seem more projecting, & with it another ?, with narrower cells, leaf broader at above base, but comparatively narrow at base, alar cells more pronounced, a little nerve, leaves more plicate, edges smooth, also points, nerve seem short & double, on stem leaves, but longer on the narrow deep plicate branch leaves, autoicous, male bracts from a broad base abruptly & long pointed, some no paraphyses.

1072 C. Amblystegium, wide celled, thick walled, entire, short nerved, few more quadrate than rest at angle.

1077 - same, & another harpinoid, with looser more gradually quadrate cells at base & narrower more sinuose cells rest of leaf, but seem broader than second of 1071, & alar cells not so distinct.

1074 seems same as group 1070, or perhaps as 1071 being more projecting cells at margin.

1072 ? same as 1075, leaves widest at or above middle, cells rather wide, border cells narrow & well defined, recurved to near apex, nerve shortly excurrent, not or but slightly spinulose

1073 male flower found, with no sign of archegoniums, paraphyses plentiful. Also Ceratodon with both flowers well developed, some Amblystegium in small quantity, young leaf broadest near base, cells, rather broad & points not so markedly spinose as thought.

1075 & leaves broadest above middle. Little toothed leaf Amblystegium & a little Brachythecium as 1070

1078 teeth double, sometimes treble perforated, 7 to 10 cells high, cells pitted, giving a very irregular ranking to teeth. Leaf of stem much expanded, crenate with projecting cells, basal hyaline cells more as in flavovirens

1079 lapillose & inclinata

1080 E. inclinata, loose celled form of Nervosa. It small bits of thick nerved ? Amblystegium, with strong nerve right up into acumen, acumen more or less channeled, cells rather narrow for the genus, a few at corners gradually more quadrate, cells projecting for some distance up edge of leaf

1081 mostly B. Nervosa, with a stem or two of E. inclinata, & a broad celled widely ovate narrow bordered bryum,